Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-13 (Cancelled)

14. (New) A fuel cell system comprising a fuel cell stack effecting power generation upon supply of a reactive gas, the fuel cell stack comprising a reactive gas passage and a water passage substantially parallel to the reactive gas passage, the reactive gas passage and the water passage being separated by a porous member, the reactive gas being humidified by water permeating through the porous member, the fuel cell system comprising:

a reactive gas pressure control valve which controls a reactive gas pressure supplied to the reactive gas passage;

a water pressure sensor which detects a water pressure in the water passage; and

a programmable controller programmed to:

calculate a pressure reduction amount in the reactive gas passage based on a power generation load of the fuel cell stack;

calculate a pressure reduction amount in the water passage based on the power generation load of the fuel cell stack;

calculate, from the pressure reduction amount in the water passage and the pressure reduction amount in the reactive gas passage, a target pressure of the reactive gas supplied to the reactive gas passage such that a pressure difference between the reactive gas passage and the water passage is within a predetermined range; and

control the reactive gas pressure control valve based on the target pressure.

15. (New) The fuel cell system as defined in Claim 14, wherein the predetermined range is set to a pressure difference range which allows the water in the water passage to permeate through the porous member to the reactive gas passage while preventing condensation of water in the reactive gas passage.

16. (New) The fuel cell system as defined in Claim 14, wherein the fuel cell system further comprises a pump which supplies water to the water passage, and the controller is further programmed to control a rotating speed of the pump according to the power generation load of the fuel cell stack.

17. (New) The fuel cell system as defined in Claim 16, wherein the controller is further programmed to prevent the rotating speed of the pump from decreasing at a rate larger than a predetermined rate when the power generation load of the fuel cell stack decreases.

18. (New) The fuel cell system as defined in Claim 14, wherein the fuel cell system further comprises a gas pressure sensor which detects a pressure of the reactive gas supplied from the reactive gas pressure control valve to the reactive gas passage, and the controller is further programmed to control the reactive gas pressure control valve to cause the pressure detected by the gas pressure sensor to coincide with the target pressure of the reactive gas.

19. (New) The fuel cell system as defined in Claim 14, wherein the reactive gas passage comprises a first gas passage end and a second gas passage end, the water passage comprises a first water passage end in the vicinity of the first gas passage end and a second water passage end in the vicinity of the second gas passage end, and the controller is further programmed to determine a target pressure of the reactive gas supplied to the reactive gas passage to cause a pressure difference between a pressure at the first gas passage end and a pressure at the first water passage end and a pressure difference between a pressure at the second gas passage end to be both within a predetermined range.

20. (New) The fuel cell system as defined in Claim 19, wherein the reactive gas is supplied from the first gas passage end to the reactive gas passage, and the water is supplied from the second water passage end to the water passage.

21. (New) The fuel cell system as defined in Claim 20, wherein the water pressure sensor (3a, 3b) is a sensor (3a) which detects a pressure at the first water passage end (1bA).

22. (New) The fuel cell system as defined in Claim 21, wherein the controller is further programmed to calculate a required pressure of the reactive gas based on the power generation load of the fuel cell stack, calculate, from the pressure reduction amount in the water passage, and the pressure reduction amount in the reactive gas passage, a target pressure range of the reactive gas supplied to the reactive gas passage such that the difference in pressure between the reactive gas passage and the water passage is within a predetermine range, and calculate the target pressure by limiting the required pressure within the target pressure range.

23. (New) The fuel cell system as defined in Claim 22, wherein the controller is further programmed to determine the target pressure range by an upper limit value P_{Gu} and a lower limit value P_{Gl} determined by the following equations:

$$P_{Gu} = P_{Wo} + \Delta P_{max}$$

$$P_{Gl} = P_{Wi} + \Delta P_{min} + \Delta P_G$$

where, P_{Wo} = the pressure at the first water passage end (1bA);

ΔP_{max} = a maximum pressure difference with which the water in the water passage can permeate through the porous member to reach the reactive gas passage;

P_{Wi} = the pressure at the second water passage end = $P_{Wo} + \Delta P_W$;

ΔP_W = the pressure reduction amount in the water passage;

ΔP_{min} = a minimum pressure difference which causes no water condensation in the reactive gas passage; and

ΔP_G = the pressure reduction amount in the reactive gas passage.

24. (New) The fuel cell system as defined in Claim 14, wherein the reactive gas comprises hydrogen.

25. (New) The fuel cell system as defined in Claim 14, wherein the reactive gas passage comprises an air passage, the reactive gas pressure control valve comprises an air pressure control valve which controls an air pressure supplied to the air passage, and the controller is further programmed to calculate a pressure reduction amount in the air passage based on the power generation load of the fuel cell stack, calculate, from the pressure reduction amount in the water passage and the pressure reduction amount in the air passage, a target pressure of air supplied to the air passage such that a pressure difference between the air passage and the water passage is within a predetermined range, and control the air pressure control valve based on the target pressure of air supplied to the air passage.

26. (New) The fuel cell system as defined in Claim 19, wherein the water pressure sensor comprises a sensor which detects a pressure at the first water passage end and a sensor which detects a pressure at the second water passage end, the fuel cell system further comprises a recirculation passage which recirculates reactive gas discharged from the second gas passage end to the first gas passage end, the fuel cell system further comprises a sensor which detects a gas pressure at the first gas passage end, a sensor which detects a gas pressure at the second gas passage end, and the controller is further programmed to calculate the pressure reduction amount in the water passage from the difference between the pressure at the second water passage end and the pressure at the first water passage end, and calculate the pressure reduction amount in the reactive gas passage from the difference between the gas pressure at the first gas passage end and the gas pressure at the second gas passage end.

27. (New) A fuel cell system comprising a fuel cell stack effecting power generation upon supply of a reactive gas, the fuel cell stack comprising a reactive gas passage and a water passage substantially parallel to the reactive gas passage, the reactive gas passage and the water passage being separated by a porous member, the reactive gas being humidified by water permeating through the porous member, the fuel cell system comprising:

first means for controlling a reactive gas pressure supplied to the reactive gas passage;

second means for determining a water pressure in the water passage;

third means for calculating a pressure reduction amount in the reactive gas passage based on a power generation load of the fuel cell stack;

fourth means for calculating a pressure reduction amount in the water passage based on the power generation load of the fuel cell stack;

fifth means for calculating, from the pressure reduction amount in the water passage and the pressure reduction amount in the reactive gas passage, a target pressure of the reactive gas supplied to the reactive gas passage such that a pressure difference between the reactive gas passage and the water passage is within a predetermined range; and

sixth means for controlling the first means based on the target pressure.

28. (New) A control method for a fuel cell system comprising a fuel cell stack effecting power generation upon supply of a reactive gas, the fuel cell stack comprising a reactive gas passage and a water passage substantially parallel to the reactive gas passage, the reactive gas passage and the water passage being separated by a porous member, the reactive gas being humidified by water permeating through the porous member, method comprising:

determining a water pressure in the water passage;

calculating a pressure reduction amount in the reactive gas passage based on a power generation load of the fuel cell stack;

calculating a pressure reduction amount in the water passage based on the power generation load of the fuel cell stack;

calculating, from the pressure reduction amount in the water passage and the pressure reduction amount in the reactive gas passage, a target pressure of the reactive gas supplied to the reactive gas passage such that a pressure difference between the reactive gas passage and the water passage is within a predetermined range; and

controlling the reactive gas pressure supplied to the reactive gas passage based on the target pressure.